

SECTION 2. ARCHITECTURE, CONSTRUCTION

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2.1 Preservation and restoration of the wooden church, which is a spiritual, historical and cultural heritage

Sacred architecture is of great importance for the historical and cultural heritage and influenced the national history, development of culture and art. The Law of Ukraine "On the Protection of Cultural Heritage" (2000) defined the issue of preservation, use and restoration of these valuable objects. Wooden temples are particularly vulnerable, as they are exposed to the destructive influence of negative conditions. Therefore, the problem of accounting and care for these sacred buildings is important and urgent.

Sacred monuments of wooden architecture reflect the ancient traditions of the people and are living witnesses of past eras. They preserve the deep traditions of Ukrainian temple building and national culture. Ukrainian church construction is characterized by a unique architectural and artistic level, a variety of artistic expressions and exquisite forms of church buildings. Despite significant losses during the 20th century, Ukraine remains the world leader in the number of sacred monuments of wooden architecture. Time is invincible for wooden structures, but some of these structures have still survived to this day in their original form.

Very often, the preservation of churches takes place at the initiative of the villagers who want to preserve their spiritual history and architectural heritage.

We will consider the technical condition of the load-bearing structures of one of these churches using the example of the technical condition of the building of the wooden Church of Saint Michael the Archangel in the village of Stanislavchyk, Lviv region (Figures 1 and 2).



Figure 1. The facade of the church in axes A/1 - E/1



Figure 2. The facade of the church in axes 1-6.

The purpose of the work: determination of the technical condition of the building of the wooden Church of Saint Michael the Archangel in the village of Stanislavchyk, Lviv region (hereinafter - the church).

The Church of St. Archangel Michael is located in the village of Stanislavchyk, Lviv Region, on the banks of the Styr River. According to Maria Buryak from the

website, the Church was built in 1799 in the Ukrainian Baroque style (information must be documented) (pictures 1 and 2).

The building under investigation is of cult purpose, made entirely of wooden supporting and enclosing structures.

In plan, the church contains an Altar with a throne measuring 6.00x6.60 m (in axes 4-5 and B-D) (Figure 3).

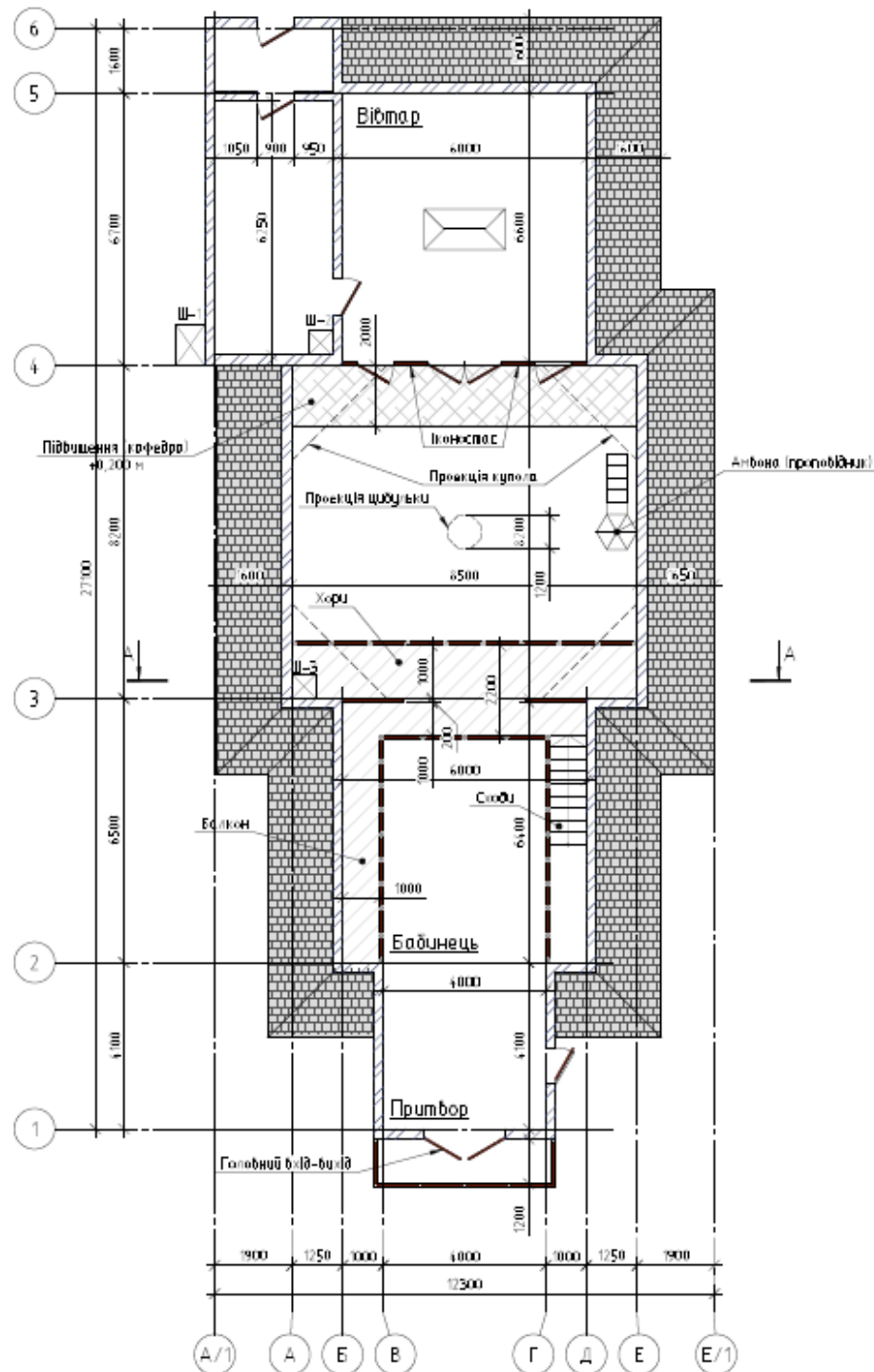


Figure 3. Plan of the church

To the left is the Zachristya with a vestibule measuring $2.90 \times (6.25 + 1.60)$ m (in axes 4-6 and A/1-B), in the center of the nave (main hall) measuring 8.50×8.20 m (in axes 3-4 and A-E) above which the dome is placed (photo 4), behind it is the Babinets measuring 6.00×6.40 m (in axes 2-3 and B-D) in which there is a balcony 1.00 m wide on three sides and stairs to the right balcony (in axes 2-3 and G-D). The balcony along axis 3 turns into Chores with a width of 2.20 m, which overhang towards the Nave by 1.00 m.



Figure 4. Photo of the church from the middle

At the entrance to the church there is a vestibule (narthex, vestibule) measuring 4.70×4.10 m (in axes 1-2 and V-G) which ends with the main entrance-exit under the canopy of the roof, which rests on four wooden columns. Between the Nave and the Altar along axis 4 is a wooden iconostasis). On the right side of the Nave is the Ambon (preacher) (in axes D-E). In Nave, from axis A to axis E along the Altar with a width of 2.00 m and a height of 0.20 m, there is a pulpit. A covered gallery 1.60 m wide surrounds the church on three sides along the axes B-A-A/1-1-4 and 6-E/1-Γ-2.

The structural scheme of the church is a wooden frame, the rigidity of which is ensured by solid wooden (made of beams) longitudinal and transverse external walls

and internal transverse walls, as well as a wooden pull placed on top of the choir floor (Figure 5).



Figure 5. Photo of the church from the middle

Above the nave is an octagonal dome, and above the rest of the church is a tabernacle roof with an outer roofing layer made of painted tin (Figure 6)..



Figure 6. Photo of the dome from the inside

To date, the building is not in use. Dimensional drawings were made during the survey of the church structures. The facades are shown in Figure 7.

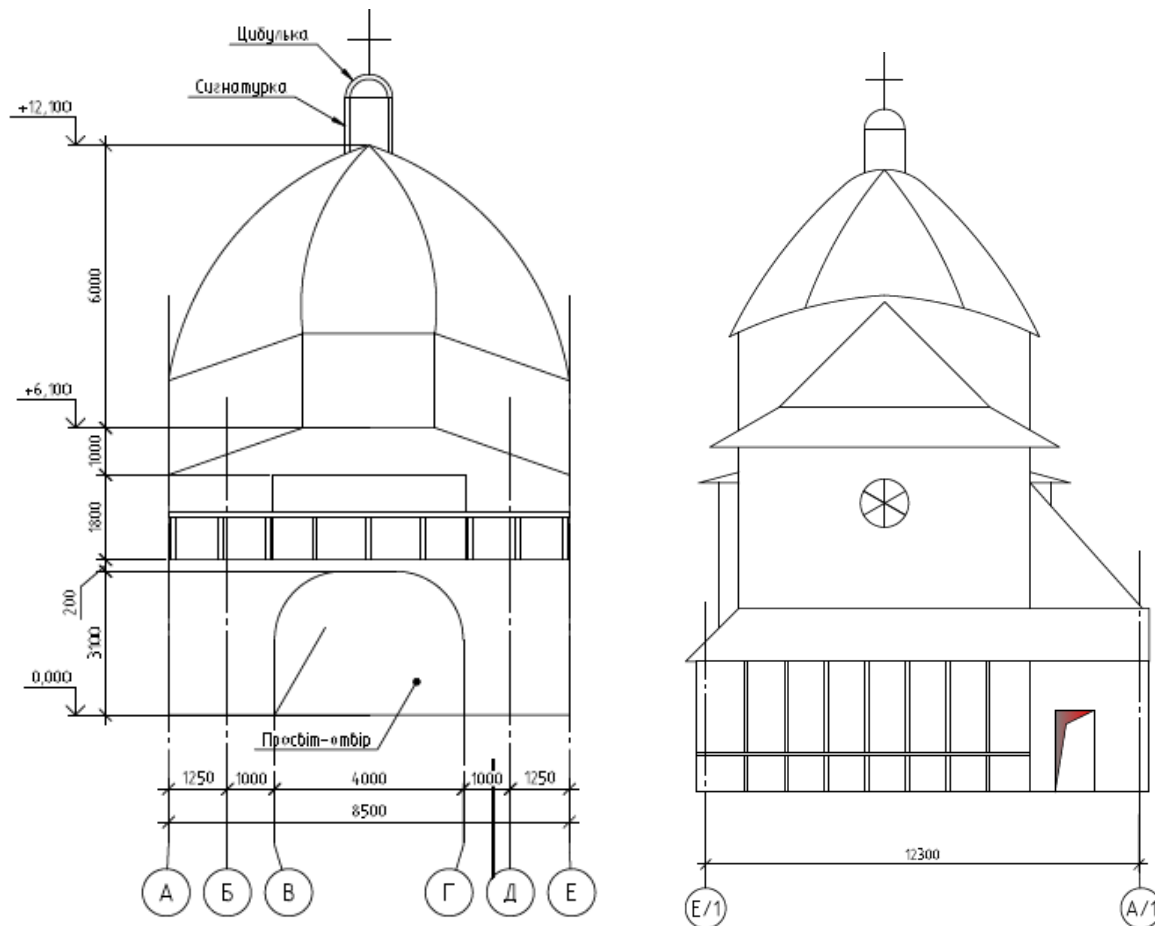


Figure 7. Facade in axes A-E and facade in axes E/1-A/1

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Pit Sh-1 is located outside the church at the intersection of axes 4 and A/1.

As a result of the inspection of the pit, it was established that the function of the foundations is performed by a stone with a height of 450 mm and a size of 400x500...600 mm, located at a depth of 0.65 m from the surface of the earth. The joint of the longitudinal and transverse wooden beams, which served as the basis for the columns and pillars of the church frame and walls, rested on the stone. As can be seen from the photos, reinforced concrete beams, possibly electric poles, with a cross-section of 200x200 mm are adjacent to the foundation stone on the left and right, which may have been used to strengthen the beds and were placed under them. Longitudinal

wooden beams - lying have signs of decay and do not fit tightly to the foundation stone, but only lie on reinforced concrete beams.

Analysis of this foundation shows that it does not fulfill its function.

In addition, there is a large subsidence of the building in this place.

Pit Sh-2 is located in the middle of the church in Zakhrst at the intersection of axes 4 and B at the intersection of the longitudinal and transverse walls. At the intersection of wooden beams - sleepers under the longitudinal and transverse walls, it was found that the foundation is missing. At a distance of about 0.5 m, these beds rest on wooden beams perpendicular to them - logs approximately 350x350 mm in size, which lie on the ground. It can be stated that there is no foundation along the axes of the walls.

Pit Sh-3 is located in the middle of the church in the Nave (main hall) at the intersection of axes 3 and A at the intersection of the outer longitudinal and transverse walls.

The analysis of the condition of the foundations of the church testifies to their state of emergency, or their complete absence in accordance with the norms and rules in force today

The floors in the middle of the church are carpeted, in the Zachrist and the vestibule are wooden. The surface of the floor in the Nave (main hall) and Babyntsi has large slopes, which indicates possible rotting and subsidence of the supporting elements under the solid board floor covering, which in places has traces of rotting. In general, the condition of the floors is unsatisfactory.

The walls A visual inspection of the walls established the following:

- wooden walls have signs of jamming and decay, especially in the Nave (main hall),

- along axes A and E, the walls have deviations from the vertical, which is evidenced by the earlier strengthening of them with the help of additional vertical bars to the entire height under the base of the dome;

in some places there is bending of the walls (possible loss of stability), this is especially noticeable in the transverse wall along axis 3;

- due to the lack of horizontal waterproofing, the lower boards of the walls are subject to strong moisture and decay.

In general, the condition of the walls is unsatisfactory.

Dome. A survey of the dome from the middle of the church showed the following:

- in the vertical walls of the dome (the lower part) there are traces of a large lock and the destruction of the decorative layer, possibly due to the decay of the boards;

- on the four angles of support at the intersection of axes 3, 4 with axes A, E, especially above the Chores in the corner inclined elements, their emergency state due to constant moisture was recorded;

- you can see the places of through holes through which sunlight enters the Nava, rain and melt water, birds;

- the windows on the Signaturka and its walls are partially destroyed, which is the reason for the entry of birds into the space of the church, which leave a significant amount of waste products.

An inspection of the dome from the outside of the church showed the following:

- decay and destruction of the covering boards, especially in the A-B axes;

- the absence of a sheet metal roof on a significant part of the dome, which believers covered and partially replaced with geotextile, which also suffered damage over the years of operation;

- the walls of Signaturka are wrapped in geotextile, which also collapsed.

The main shortcomings of the dome listed above indicate its emergency condition.

General comments based on the results of the visual inspection:

- a significant part of the wooden elements and structures of the church have traces of jamming, decay and are damaged by fungus;

- the whole church has an inclination to the side from the vertical in the direction of the north;

- window frames with glazing and all doors are in unsatisfactory condition;

- the covered Gallery around the perimeter of the church is in unsatisfactory condition

condition, especially in need of repair or replacement of its structural elements and roof;

- there is no system for draining rainwater and meltwater from the roof (gutters and downpipes) and water from the church building and its territory;
- there is no fire safety system for the church and bell tower.

Bell tower. In addition, we can say about the state of emergency of the bell tower, in which there is destruction of the board elements of the walls, structural elements of the second floor (loft), stairs, and the state of emergency of the dome (Figure 2).

Based on the results of the preliminary visual inspection, the following conclusions can be drawn:

1. The church building under inspection is in an emergency (4) condition.
2. For the possibility of further safe operation of the church building, it is necessary to prepare a comprehensive project for the reconstruction of the church, taking into account the restoration task.

The main works to be provided by the project:

- perform a detailed instrumental technical survey of the church building and bell tower;
- carry out a project to restore the foundations under the entire church building;
- execute a project to strengthen wooden longitudinal and transverse walls;
- carry out a project to restore the structures of the dome and tent roof with a complete replacement of the roof;
- execute the project of strengthening and restoration of structures and the roof of the Gallery;
- perform work on installation of water drainage systems from the church and from the church;
- perform repair or replacement of glazed window frames and doors;
- repair or replace the floor.

3. The belfry structure under inspection is in an emergency (4) condition.
4. It is necessary to carry out work on streamlining the legal status of the church and its registration with the relevant state authorities and BTI.

5. It is advisable to carry out a study of the church for its historical and cultural value as a monument of Ukraine with the participation of restorers, and possible implementation of a restoration project.

Summarizing the survey of the wooden church structures considered above, it can be stated that this issue is very important and urgent, and requires the support of the state and public organizations to preserve the spiritual, architectural and historical heritage of Ukraine.